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National Parks — contain lists of birds. The list for Glacier Park, Mont., published this year for the first time is by Mrs. Florence Merriam Bailey and consists of brief notes on 184 species. Lack of space made it necessary to condense the statements as much as possible and consequently less than half a dozen lines are devoted to any one species. The list for Sequoia Park, Calif., including also the neighboring General Grant Park was prepared by the Superintendent, Walter Fry, and has been published each year since 1912. It contains 182 species but only about 50 of them are marked with an asterisk to indicate presence in General Grant Park. Evidently much more work remains to be done on the birds of this park. Moreover the notes are less than a line in length and are confined to mere statements of the status of each bird as "common resident" etc. The list for the Yellowstone Park, Wyo., is the work of M. P. Skinner and appears under his name for the first time, having been published anonymously in 1915, 1916 and 1917. It contains 194 species but the notes like those of the Sequoia list state merely whether the species are residents, summer residents, migrants, or occasional visitants. More space should be given such lists so that notes of local interest can be included and exact dates and localities given for species which occur irregularly or only occasionally.

When it is recalled that Glacier Park is larger than the state of Rhode Island, that the Yellowstone Park is two thirds the size of Connecticut, and that these reservations are visited by thousands of tourists every year, the importance of having complete and accurate lists of the birds can hardly be overestimated. Similar lists should be published at an early date for several of the other parks especially Crater Lake, Mount Rainier, Rocky Mountain and Yosemite.—T. S. P.

Economic Ornithology in Recent Entomological Publications.—

A decrease in items includable under this heading is apparent and the present fasciculus of papers noted is the whole fruit of more than six months waiting. The articles relate to:

The Rhinoceros beetle (*Oryctes rhinoceros*). This species kills annually something more than one percent of the coconut trees of the Philippine Islands entailing a yearly money loss of nearly three million dollars. The natural enemies are few but among them are two birds, the Philippine Crow (*Corone filipina*) and the common roller (*Eurystomus orientalis*).¹ Adults of the Rhinoceros beetles are of heavy build and from one and one half to two inches in length and the larvæ are even larger. It is to be inferred therefore that the large size of the insect is an important factor in limiting the number of its predatory enemies.

The round-headed apple-tree borer (*Saperda candida*). In the Ozark region of Arkansas whole apple orchards have been abandoned because of the destruction of trees by this pest. A single individual of the species

¹ Mackie, D. B. *Oryctes rhinoceros* in the Philippines. Philippine Agr. Rev. Vol. X, Fourth Quarter 1917, p. 326.

can kill a small tree and if two or three are present they are almost certain to cause death. The author of an extensive bulletin on this pest, states that he has seen evidences that woodpeckers prey upon the species in Ozark orchards, and that other natural enemies are few.¹ Other entomologists have testified to the value of woodpeckers in destroying larvæ of various species of *Saperda*, but it will be well also to draw attention to the fact that other birds feed upon adult *Saperda* and are of some value in keeping the species in check. These birds, so far as known, include the Magpie, Bluejay, Cassin's Kingbird, Red-eyed Vireo and Robin.

The southern corn rootworm (*Diabrotica duodecimpunctata*). This abundant flower beetle is the most familiar black-spotted yellow beetle over the whole United States. It is seriously destructive to corn in the southeastern states, its ravages frequently necessitating replanting. Full credit is given to its bird enemies in a Bureau of Entomology publication,² but more recent information makes it possible to improve upon the account. Thirty-seven species of birds are known to feed upon this species of *Diabrotica*. The largest number of specimens found in the stomach of a single bird was 18 taken by a Cliff Swallow. Twenty-three species of birds are known as enemies of the southwestern rootworm, a form which although called a separate species (*D. soror*) probably is only varietally distinct. The *Diabrotica* are typical of what are called warningly colored insects and which are supposed to be more or less shielded from predatory attack. The relations of birds to them however, give little comfort to believers in this theory.

The southern green plant-bug (*Nezara viridula*). This insect agrees with the last discussed, in being a pest in the south, and in belonging to the category of theoretically protected insects. The basis for the latter thought is alluded to in a recent statement³ about bird enemies. "In spite of the disagreeable odor of the species of the genus, the Bureau of Biological Survey has recorded finding specimens of *Nezara* in the stomachs of certain birds, but it appears to have been always *hilaris* that was found. *N. viridula* is probably also eaten."

Confirmation of this prophecy is now at hand as *N. viridula* has been identified in a number of stomachs of Franklin's Gull. From 20 to 40 specimens of the bug were taken by individual birds. The species has been found also in the stomach of Say's Phoebe. Probably many of the specimens from bird stomachs identified merely to the genus *Nezara* were of the species *viridula* for there is no reason to believe that discrimination would be shown. Thirty-one different kinds of birds are known to feed upon *Nezara*, further unidentified, and no fewer than 26 specimens were obtained from the stomach of a Purple Martin and 100 from a Franklin's Gull.

¹ Becker, Geo. G. Bull. 146, Ark. Agr. Exp. Sta., July 1918, p. 25.

² Luginbill, Philip. The southern corn rootworm and farm practices to control it. Farmers' Bull. 950, U. S. Dept. Agr., May 1918, p. 8.

³ Jones, Thos. H. The southern green plant-bug. Bull. 689, U. S. Dept. Agr., July 30, 1918, p. 21.

White grubs (*Lachnosterna* spp.). The award to birds of first place among natural enemies of white grubs, cited in 'The Auk' (Vol. 30, No. 4, Oct., 1913, p. 602) is repeated in a revision of the bulletin¹ there quoted. Added information is to the effect that: "The U. S. Biological Survey has found these insects in the stomachs of 78 species of birds and 2 species of toads.

Insects that carry stock diseases. The writer cannot forbear to add another to the contributions he has made to the discussion of the distribution of stock diseases. In the very first article on the subject,² the statement was made, regarding anthrax, that "The fact that the disease may be carried by flies is more than sufficient to explain the most severe epidemics" (p. 298). The author of one of the papers reviewed at that time now has published the results of further experimentation and reports³ the positive findings that the horn fly, horse flies and mosquitos are capable of transmitting anthrax by feeding upon a healthy animal after biting an infected one. In the face of such evidence, of which much was available years ago, the waging of a severe campaign against Turkey Buzzards as the most important carriers of stock diseases, is a deplorable example of popular disregard of scientific teachings.—W. L. M.

Centurus radiolatus in relation to Cocoa in Jamaica.—The Jamaica Woodpecker has been the subject of many complaints of doing damage to cocoa pods. The matter has been investigated by Mr. A. H. Ritchie, Government Entomologist, and his report has recently been published.⁴ By stomach analysis and field observation he finds that the normal food of the bird is fruit pulp, seeds and insects. Most of these items were specifically identified and lists of the names are given. Mr. Ritchie found no direct evidence of damage to cocoa, a conclusion supported by letters reproduced in the previous issue of the Journal (22, No. 2, February, 1918, pp. 65-69). Two or three writers state that they have long had standing rewards for woodpeckers with remains of cocoa pods or seeds in their crops, but have never had a bird presented. One of these writers also gives a number of stomach analyses. The investigation so far as it has proceeded, is clearly in favor of the Jamaica Woodpecker and the burden of proof of damage done rests upon the accusers.—W. L. M.

Further Notes on Possible Avian Distribution of Hog Cholera.—The full report of the experimental investigations of the distribution of hog

¹ Davis, J. J. Common White Grubs. Farmers' Bull. 940, U. S. Dept. Agr., May, 1918, p. 12.

² 'The Auk,' 30, No. 2, April, 1913, pp. 295-8. Succeeding articles are in Vol. 35, No. 2, April 1918, pp. 253-4 and in Farmers' Bull. 755, U. S. Dept. Agr., Oct. 26, 1916, pp. 37-9.

³ Morris, Harry. Blood-sucking Insects as Transmitters of Anthrax or Charbon. Bull. 163, La. Agr. Exp. Sta., March 1918, p. 15.

⁴ Journ. Jamaica Agr. Soc. 22, No. 3, March 1918, pp. 102-107. Issued separately and repaged 1-6.